Protection Criteria for Audio PMSE

1. Hardware test procedure

**Definition:**

The PMSE protection level can be described as the unwanted signal level which degrades the PMSE receiver output audio S+N/N to 80 dB(A).

![Test setup diagram]

**Test procedure:**

- Set signal generator A to receiver frequency (f_C)
- Set wanted signal generator A to the necessary modulation parameters (e.g. FM, Deviation +/- 24 kHz, AF 1000 Hz)
- Set signal generator A RF output level measured at receiver input to -85 dBm
- Set unwanted signal generator B on receiver frequency (f_C)
- Set signal generator B RF on smallest output level (e.g. -130 dBm)
- Set signal generator B to Modulation FM, Deviation +/- 24 kHz, AF 400 Hz
- Modify signal generator B RF output level until receiver S+N/N degrades to 80 dB(A).
  
  **Note:** If required due to the used analogue audio compander technique employed, the unwanted level can alternatively be measured on an audio quality limit of 30 dB SINAD.
- Record the generator B RF level measured at receiver input
- Repeat the measuring on other interfering frequencies and record the generator B RF level measured at receiver input

2. Preview on the results

**Analogue Audio PMSE**

Depending on the receiver construction a co-channel interference level of about -110 to -115 dBm will be measured.

**Digital Audio PMSE**

With spectrum efficient modulations an unwanted interferer level of -115 dBm is to apply.
3. Derivation of interference level

a. PMSE quality threshold in operation
   The minimal working field strength is -85 dBm. This level includes fading notches. With a 30 dB C/I a quality degradation of 1 dB appears.

b. PMSE receiver sensitivity
   An actual PWMS receiver offers a sensitivity of -110 dBm. Typically RF squelch is set to -95 dBm. The minimum quality level with current equipment is given at -95 dBm with 20 dB C/I. Under these conditions a quality degradation of 3 dB appears.

Both examples calculate a maximum interference level of -115 dBm in 200 kHz channel. This can be transferred into a relative interference level of -168 dBm/Hz.

4. Estimation of the maximum PMSE Interference level

![PMSE Receiver: Maximum Interference Level [dBm@50Ohms] @ ChBw = 200 / 800 kHz](image)

Note: active antenna distribution components are not considered (PMSE receiver only).

(C) M. Fehr, October 2015, Editorial update as of February 2017